WHAT IS CLAIMED IS:

1. A handler for applying a vacuum holding force to an object, the handler comprising:

a body having a plurality of levels of openings including a holding surface level and a suction surface level, wherein the openings at the suction surface level are larger than the openings at the holding surface level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level.

2. The handler as in claim 1, wherein the frequency of the openings at the holding surface level is greater than the frequency of the openings at the suction surface level.

3. The handler as in claim 2, wherein at least a portion of the openings at the suction surface level that are in fluid communication with at least a portion of the openings at the holding surface level are in direct fluid communication by alignment of the openings,

further comprising interconnecting openings for interconnecting openings at the holding surface level that are not in direct fluid communication by alignment of the openings.

4. The handler as in claim 2, further comprising at least one intermediate level between the holding surface level and the suction surface level, wherein the openings of the intermediate level are larger than the openings at the holding surface level and smaller that the openings at the suction surface level.

5. The handler as in claim 4, wherein the frequency of the openings at the intermediate level is greater than the frequency of the openings at the suction surface level.

6. The handler as in claim 5, wherein at least a portion of the openings at the suction surface level that are in fluid communication with at least a portion of the openings at

the intermediate level are in direct fluid communication by alignment of the openings, and at least a portion of the openings at the intermediate level that are in fluid communication with at least a portion of the openings at the holding surface level are in direct fluid communication by alignment of the openings,

further comprising interconnecting openings for interconnecting openings at the intermediate level and at the holding surface level that are not in direct fluid communication by alignment of the openings.

7. The handler as in claim 1, further comprising at least one micro-mechanical valve in at least one of the openings.

8. The handler as in claim 1 formed of a material selected from the group consisting of metals, alloys, semiconductor materials, ceramics, and combinations comprising at least one of the foregoing materials.

9. The handler as in claim 1 formed of a semiconductor material selected from the group consisting of silicon, III-V type semiconductors, II-IV type semiconductors, II-VI type semiconductors, IV-VI type semiconductors, Ge, C, Si-oxide, Si-nitride, and combinations comprising at least one of the foregoing semiconductor materials.

10. A method of making the handler as in claim 1, comprising micro-machining the openings at each level.

11. A method of making the handler as in claim 3, comprising micro-machining the openings at each level.

12. A method of making the handler as in claim 1, comprising stacking patterned layers to form the openings at each level.

13. The method as in claim 12, wherein each patterned layer is provided by selectively adhering a layer to be patterned to a support layer, patterning the patterned layer, and removing the patterned layer from the support layer.

14. A method of making the handler as in claim 3, comprising stacking patterned layers to form the openings at each level.

15. The method as in claim 14, wherein each patterned layer is provided by selectively adhering a layer to be patterned to a support layer, patterning the patterned layer, and removing the patterned layer from the support layer.

16. A handler for applying a vacuum holding force to an object comprises:

a handler body having a thickness, a holding surface having a plurality of holes for imparting vacuum force to an object, and a vacuum surface having at least one hole for a vacuum source, the holding surface holes having diameters suitable for holding fragile objects utilizing a vacuum holding force, wherein vacuum paths are formed from the plurality of holding surface holes to the at least one vacuum surface hole, the vacuum paths configured, positioned and dimensioned to reduce resistance of gas flowing through the vacuum paths.

17. The handler as in claim 16, wherein the ratio of the handler body thickness to holding surface hole diameter is about 10^7 to about 10^2.

18. The handler as in claim 16, wherein the ratio of the handler body thickness to holding surface hole diameter is about 10^6 to about 10^3.

19. The handler as in claim 16, wherein the ratio of the handler body thickness to holding surface hole diameter is about 10^5 to about 10^4.

20. A method of processing a thin film comprising:

providing a first thin film to be processed;

attaching the first thin film to the handler of claim 16, and

processing the first thin film utilizing the handler as a temporary substrate.

21. The method as in claim 20, further comprising disconnecting the thin film from the handler.

22. The method as in claim 21, further comprising providing a second thin film to be processed, attaching the second thin film to the handler, and processing the second thin film utilizing the handler as a temporary substrate.